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Introduction to Credit Derivatives

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Summary: Since the mid-1990s, credit derivatives have taken on a larger role in financial institutions' efforts to isolate credit risk from other risks in their portfolio. The current market size for credit derivatives is over \$2 trillion and continues to grow exponentially. This teaching session on credit derivatives covers credit derivatives and how they have evolved, with the main focus on credit-default swaps (CDSs). It also covers questions, such as: How do banks, insurers and reinsurers use these instruments (hedge, take risks, etc.)? What are some of the pros and cons of using credit derivatives? The session also focuses on improvements in the credit derivatives market (ISDA, restructuring, etc.). Finally, it covers some of the regulatory hurdles insurers need to be aware of when using credit derivatives.

MR. CRAIG FOWLER: We're going to run through all the processes of credit derivatives, starting off with a basic definition of credit derivatives, how they're used and some advantages of credit derivatives. We'll walk through some regulatory pieces, explain what the landscape is like for a life insurance company to use credit derivatives, give a pricing overview, an example of how to price these instruments, and then at the end, Greg will wrap up with discussion about current developments in the market.

We have three presenters. First up will be Kevin Reimer from ING Institutional Markets. Kevin is a senior director of business development at ING, and he works on different new business initiatives and alternative structured products within that group. He has been involved in looking at credit derivatives for that business unit in Denver. Another speaker will be Greg Henke from Citigroup. Greg heads up the insurance industry resource group in New York, which is responsible for developing and executing transactions to meet the different tax, GAAP, statutory and economic

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goals of the insurance company clients. He also is involved in securitizing insurance risks off of companies' balance sheets.

Finally, we have Michael Hambro from AON Consulting, who is a vice president and managing actuary with AON. He provides consulting services to the insurance industry and specifically gets involved in items like ALM and cash-flow testing, embedded value analysis, M&A analysis, business and capital planning, product development and a variety of other initiatives for AON.

MR. KEVIN J. REIMER: What is a credit derivative? Simply put, a credit derivative is an agreement that transfers credit risk between parties. These are private transactions and, like a lot of other over-the-counter products, they can be negotiated and customized. Due to the explosive growth over the past few years, there are large and liquid markets for players to participate in. Another way to look at it is that you're either synthetically creating or eliminating credit exposures. So if you're creating credit exposure, you are selling or writing a credit derivative, and that can be considered a replication of the underlying cash market, buying a cash bond. Or if you're eliminating credit exposures, you could be buying in order to hedge a particular exposure and a current name. That would be similar to selling a bond in the cash market.

Credit derivatives are becoming the purest way to take on or hedge credit risk. If you compare it to buying a bond in the cash market, you have interest rate exposures as well as credit exposures, which you don't have in credit derivatives. You don't have the interest rate exposure there. And individual bonds may exhibit richness or cheapness, depending on supply and demand and the status of the bond, whether it's off the run or on the run, and there may be optionality and embedded features in a bond that don't exist in a pure credit derivative, CDS, or something like that. One thing to keep in mind is that no direct loss for a protection buyer of a credit derivative really has to occur in order for that protection buyer to be paid. This is a little different than an insurance contract, for example. Similar to interest rate swaps, credit derivatives would use ISDA master agreements and ISDA documentation with counterparties.

What are the different types of credit derivatives? The most common one is probably single name CDS. Other very common ones are collateralized debt obligations (CDOs) or collateralized loan obligations (CLOs). Similar to an insurance company portfolio, you might know a little bit more about what you might see on the asset side, collateralized mortgage obligations (CMOs). But similar to those, really what you're doing is splitting it up into different pieces of the pie, and depending on where you are in the waterfall of the potential losses you might be for taking on the first loss, which is called the equity tranche, where you're taking the last loss, which is the super senior tranche.

Credit-linked notes (CLNs) are a structured transaction where a credit derivative is embedded inside the note, and the principal payoff at maturity depends on if there

is a credit event that has occurred or not.

A total rate of return (TRoR) swap is an agreement between two parties, where party A agrees to pay LIBOR plus or minus a spread in exchange for the other party paying on the change in market value of a referenced credit and whether that is the income of capital gains and losses pieces within that.

An asset swap (AS) is more like an interest rate swap. I don't think they are part of credit derivatives, but the British Bankers Association uses them in their lists. So I'm not going to really argue with them.

Basket CDS is a pool of underlying names, where you can structure it like you're taking on the first to default or last to default. Another option-like product is a credit spread lock option. And for one of those, you would have a strike price, in this case a strike spread, such that the payoff at maturity depends on the difference between the actual and the strike spread at that time.

Regarding the breakdown of the markets in credit derivatives for 2004, CDS, CDOs, and CLOs make up the majority of it, almost 70 percent, with the rest of the types making up some more parts of that. As the market evolves over time, we think some of these more exotic types and next-generation products will grow as well, and Greg is going to touch on some of those next-generation products in his presentation.

To get into a bit more detail now on CDSs, what you have is a protection buyer, a protection seller, and an agreement between those two. Whether you're actually buying or selling, usually the counterpart on the other side is a dealer. So the protection buyer is agreeing to pay so many basis points per annum to the protection seller in exchange for contingent payment. That payment depends on a credit event that might occur. The credit event is made up of one of the following events that have to happen: failure to pay, bankruptcy, an obligation default and an obligation acceleration. This last one is no longer as common. The next one, as well, repudiation-moratorium, it's more like a refusal to pay. It used to be a stand-alone event for credit derivatives, but recently they've added the fact that, within a certain defined time period, it has to be followed by a restructuring or failure to pay.

The last one is probably the most controversial credit event, and that's restructuring. Right now you have potentially four options that you can do. One of them is to remove restructuring as a credit event completely, or three other ones that have a narrow definition of what restructuring really means. There's already some tradeoff between whether you want to actually sell protection on a credit derivative on a particular name. If you want to remove restructuring completely, you're probably looking at a 10 percent or more discount in spread, of what you can get versus what you would if you included restructuring. If you take a particular name and you're going to get a premium of 70 basis points, if you concluded

restructuring, you might end up with only 63 basis points or less if you wanted no restructuring. So there's a risk-return tradeoff and you have to decide what you're comfortable with, adding pieces that are not as common in buying a bond for having a credit event, versus this and the tradeoff between what the spreads are.

Let's get into an example on CDSs. Let's say we have a protection buyer who wants to buy protection. We'll use Walt Disney Company as our example. If we go to a protection buyer here who wants to buy protection on Disney, back on September 16, 2003, when this was written, the quote did ask for 66/67. The quotes in credit derivatives are defined usually for \$5 million to \$10 million transactions, for a five-year tenure. In more liquid names, you're seeing fairly tight bid-ask spreads as well for different tenures. But in this case, firm A is going to agree to pay a premium of 67 basis points per annum, until maturity, or until the credit event occurs. That premium can be paid upfront, quarterly, depending on convention or what you negotiated with the counterparty.

Now if the credit event actually does occur, there are two methods for settlement. The first one is cash settlement where the protection seller pays the protection buyer the par value less a recovery value. That recovery value is usually determined by averaging, say, three dealer quotes out in the market, within a specified time period of an actual event happening. Obviously, that could be lower than what the ultimate recovery value in the workout of an actual event might occur, but you have to make that tradeoff between whether you want to take it on, which is the next method of settlement, by actually taking on and taking physical settlement of the security. In the physical settlement, the protection seller will pay part of the buyer and then the protection buyer will go and get a defaulted security in the market on that particular name and deliver it to the protection seller. Similar to a futures market, that defaulted security will be the cheapest to deliver option, so whatever is the cheapest to get in the market, that's what you get delivered. This is a good option for the protection seller though, if the protection to the seller's firm has a good workout team and provisions that can hopefully get a more reasonable value over time for the default security.

So how did credit derivatives evolve? The first transactions were done in the early to mid 1990s, primarily by the banks and primarily in the United Kingdom. We see that still a lot of the transactions are currently done with CDSs in London. The banks were net buyers to get regulatory capital relief, but they also did it to manage their lending books. If you manage exposure on that, if you want to still maintain a client relationship, the nice thing about a credit derivative is that it's a private transaction. Therefore, the client still doesn't know that you're managing the book off to the side and hedging things, allowing you to increase your exposures to that client. That's where they evolved.

In 1999, ISDA added credit derivative definitions to a stock imitation to make those contracts more standard and transparent and make the markets evolve. In 2000, Conoco had to restructure its debt and that's kind of a classic case where there

were a lot of disputes between what constituted credit event and what didn't between the different players in credit derivatives. Therefore, there was a lot of uncertainty. In 2001, ISDA created these supplements that clarify what restructuring was. Then again in 2003, they incorporated all these supplements and added some different definitions for restructuring. All these improvements basically helped to converge the two markets between the cash and the synthetic market.

Ever since 1999, when ISDA came out with the definitions, there has been really exponential growth in credit derivatives. I've seen numbers more recently for 2003 estimates around \$3 trillion to \$3.5 trillion. But to put it in perspective, it's still a young market, because interest rate swaps have been around \$70 trillion and up basically. It's tough to get good numbers on these surveys. This is because, with derivatives, you always have a buyer and a seller on the other side. So if you start doing surveys on volumes, there might be some duplication.

The point is that markets have grown; they continue to grow; and there is definitely a liquid market in many names. As far as the players, between the protection buyers and the protection sellers, the largest users on both sides are still the banks. They are still net protection buyers, and insurers have been concentrating on the seller side, probably because of their core competencies of analyzing and taking on credit risk on the balance sheet.

MR. GREGORY P. HENKE: As Kevin mentioned, banks were really the early large players in the credit-default-swap marketplace. It's interesting because a lot of people ask us, "One of my fears is that banks are the buyers of protections and I'm afraid that they know a lot more about this than I do," and I respond, "They do." That's something you should be very nervous about. They know those portfolios cold. They know what they're buying protection on and why. But there are viable reasons for them to buy protection in the marketplace. As Kevin mentioned, a lot of it is regulatory arbitrage. I also think it's important for insurance companies to look at what drives the bank's regulatory arbitrage, so you can understand what they're trying to do and why. Does it really make sense? I would encourage you to look at Basel. The banks globally have very good standards as to how to measure a book of credit risk. I think that's important, not just for understanding how the banks are managing credit risk. If you look at how insurance companies approach risk management—whether it's driven by rating agencies or regulators or whatever—they're also following Basel and will learn from that. A lot of your constraints will be driven off of rules similar to Basel so if nothing else, you should pay attention to them because I think they'll have a bigger impact on insurance companies going forward.

Kevin already mentioned why they might want to lay off credit risk. Many banks are regional. If you're a bank or an S&L in Texas, you're going to be overexposed to certain industries and you're going to want to continue to do business with those clients. At Citigroup, we have a lot of clients we do a ton of business with. We have a broad relationship with them. We're making money off of different kinds of

transactions and additional loans. It'll be common for us, as Kevin mentioned, to go out on a private transaction, so the client doesn't even have to know that at some point we've capped off our risk to that counterparty and we'll go out and buy credit protection against them, in a privately negotiated transaction.

One of the things that's interesting too, over time, is that the banks were very big buyers and they were almost sole buyers. If you look at their portfolios in 2002, a lot of them didn't do this to get hedge accounting treatment. They really did it from a risk-management, balance-sheet arbitrage perspective. So when they bought credit protection on a lot of their clients, they didn't get hedge accounting treatments. When spreads were widening out in 2002, because they had bought protection, the protection was getting more and more expensive to buy. They were actually recording profits running through their GAAP earnings because of their hedging operations. They weren't getting hedge accounting treatment. What's happened this year is that that's largely reversed. Banks were net buyers, spreads have been coming back in, and their positions have been getting marked down. They were actually recognizing losses through their GAAP earnings, and they said, "Wait, wait this is a terrible thing. Who thought of doing this?" So they actually tend to be more net buyers than sellers, which is really what they should be doing. They're buying protection on their big clients that they're overexposed to, and they will sell protection on other names, because they really don't want to net/net go long or short. They're really using this as a risk-management tool, and I think that's important, because I think that's what really has improved a lot of the liquidity and transparency, when you'd have banks being more two-way players. That's also helped a bit when I get to reinsurers, but that's why it's more common for them to buy and sell protection but maintain a credit exposure and aggregate.

When the banks were big net buyers, my guess is that included reinsurance companies. If you look at the big net sellers of credit protection in the synthetic space in 2001 to 2002, it was what I would call a reinsurance company. They obviously fall under insurance companies for broad categorization, but it was the big reinsurance companies. Obviously reinsurers take risks in order to make profits. They looked at the risk-adjusted profits—what they expect to make versus expected defaults—and this looked like a great business for them to be in. It was diversified from their other risk. What's interesting is that reinsurers really hadn't been able to play active in credit space because they weren't really cash buyers of bonds. You can go to a reinsurance company and say, "How do you like to do business?" They say, "Well, we take in premium and if there is a claim we pay it out." So that's much different from an insurance company who is taking funds in from retail investors and investing it for long periods of time and is very active in the cash bond marketplace. You have this kind of confluence of events where reinsurers wanted to play this game, printed default swaps, finally put it in a form which they like, which is taking in premium today and then paying out if there are claims. So they were very active sellers in the marketplace.

But what's happened is, unfortunately, the reinsurers were big players in 2001 and

2002. They were selling credit derivatives and so their marks to market obviously hurt them. They had earnings losses through that. Some economic loss, some mark-to-market losses, and so you lost a big protection seller basically in late 2002, which is probably the last time you wanted to back out of the marketplace. But fortunately, banks entering both sides of the market helped, and I think the next wave is going to be if life insurance companies can take more of their role. They're obviously huge credit managers in the cash marketplace. Will they become more active in the synthetic space and help fill that gap?

What are some other users of hedge funds and why? In late 2002, when reinsurers stepped back from the market, it was the hedge funds that stepped in and were big net sellers. They looked at the wide spreads, and they didn't have a lot of the GAAP accounting constraints that other people did. They just said, "I'm very happy getting paid 4 percent a year on a company that I think might have a 2 percent default rate. So net of recovery expected is a 1 percent loss, and I'm going to get paid 4 percent." One of their biggest issues right now is whether or not to take their bets off the table. They make big bets at very wide spreads. They sold protection, now just a year later, their mark to market is hugely positive, and the question is, do they continue to ride out the position or do they liquidate it? But they were big players and big winners.

There is another place they'll use it. Kevin mentioned asset swaps, but they are also big convertible bond arbitrage players. They will buy convertible bonds and sell the equity volatility. Then they may or may not buy credit protection on those credits. So they're doing a lot of convertible bond arbitrage, using both equity derivatives and CDSs as well.

We're seeing more corporates active in the CDS marketplace, and I think that's interesting. A few years ago, we had companies coming to us like Dell and Lucent who were selling a lot of equipment to dot-coms, and all of a sudden you looked at their balance sheet and they had literally several billion dollars of receivables from these companies that they had financed to purchase of all this equipment. Well, sure enough, these weren't very high quality companies. They came in and they said, "What would it cost to hedge this \$4 billion of receivables to these companies that have no earnings and no ratings and basically no future?" They were not very happy with the answers they got back. I thought that was a good part of market discipline. When they went to price that in, they realized that they were vastly overstating profits, because if they had done them on a risk-adjusted basis there's no way they were making anywhere near the profits they were suggesting. But now that spreads are back in, I think some of these companies have learned their lessons and will start to look at buying protection on vendors and clients and things like that.

Another example would be if a company has non-qualified benefits for their senior executives. In these plans, obviously, they're a general creditor to getting their supplemental retirement income and things like that. There are some ways without

querying the tax treatment that they can actually buy protection on the corporation to protect their general creditor status, towards longer term benefits and things like that.

Other kinds of non-life insurance uses include workers' comp. I didn't figure this out at first, until we worked with some clients and they realized that when they sell a workers' comp policy with a deductible, they have credit exposure. Let's assume a \$50 million deductible workers' comp policy sold to Wal-Mart. In theory, the workers' comp coverage people will pay the first dollar of claim and then go after the client (or Wal-Mart in this example) to make good on the deductible. So, in theory, they have exposure there. These are just other examples as we get more aware of these markets where credit risk is popping up in places where people really don't think they're taking credit risk, so we've seen some people come in and buy protection on workers' comp clients.

Managing reinsurance receivables would be another example. You know, I'm fascinated. I'm usually talking more to the asset side of the house, and with everything that happened over the last couple of years, they brought per-issuer limits down severely. You might talk to them and they'd say, "We won't take more than \$50 million of exposure to any corporate name, given all the volatility and event risk out there." Then you pick up their balance sheet and you realize they have \$200 million of reinsurance recoverables from one reinsurance company. Would you buy a \$200 million bond from that reinsurance company? They say, "Of course not. That would violate every risk-management guideline we have." So now that spreads are back in and buying protection is reasonable, you're seeing people go back and look at not just their explicit asset exposures, but their relationships with clients, reinsurance recoverables and things like that and saying: Is this a good time to lay off some or all of that risk?

Life insurance companies. The prime example people are using is what we call the synthetic guaranteed investment certificate (GIC) block. The other example is changing your profile without triggering a deemed sale. I think this is going to become more and more important. Let me just give you an example. Let's say you bought 20-year Wal-Mart bonds a year ago when their credit spread (we'll do it spread to LIBOR) was 80 basis points. Sure enough, it's tracked back in with the market, and now it's only 40 basis points. Your investment people should be patting themselves on the back. That was a great call. They bought wide. They got a ton of spread narrowing. It was a good credit call on their part.

But now the problem is, they think it's fairly valued and would like to reinvest in something else. So they look at selling the bond, but interest rates have come down 200 basis points in the interim, so because of the bond's long-duration characteristic, it's trading at 120 cents on the dollar. If they go out and sell that bond in the cash marketplace, and reinvest, they're going to get a tap on their shoulder from the CFO. I think we've all been there. What's the CFO going to say? He's going to say, "You just generated \$20 in taxable capital gains, and I know we

would have done that over time, but it would have been spread over 20 years. You just hit me with it today. You recognize the GAAP capital gain, which the equity analysts are going to ignore, and you just cut my margins on future GAAP income. That spread in a sense got compressed and up-fronted, and now I won't have that return-on-equity (ROE) calculation going forward. Don't sell it." You're landlocked.

So what can you do in a situation like that? If you didn't want to take the credit risk anymore, you could buy protection on Wal-Mart and then sell credit protection on some other name. You could move your credit profile that way, or you just start to ask yourself the question, "Should we start to bifurcate the way we manage credit risk and the way we manage duration risk?" There are some other examples for why to do that, but I think that's an example of the flexibility that credit derivatives can give you.

Another example is to access higher quality credits and that's part of the synthetic GIC example, but insurance companies are not cheap funders, at least compared to banks. Even if an insurance company likes Wal-Mart at LIBOR plus 40, if they're going to sell a product, whether it's a single-premium-deferred annuity (SPDA) or GIC that they think they're bringing in funds at LIBOR plus 10, even if they think Wal-Mart is a great LIBOR plus 40, there's no way that that 30-basis-point net spread is going to be enough to cover the capital charges and everything else associated with that business. And they basically get locked out of playing in the real high credit quality marketplaces, especially today when credit spreads are tight. So, as Kevin mentioned, there are different ways to leverage in CDSs. You can just do a single name CDS. You could also look at a basket of very high-credit quality companies and take a levered exposure first to default or something like that, in a sense to get more spread out of a different pile of risk. I know people out there say the first to default, that's very risky. I mean if you look at it probabilistically, there's a fair tradeoff between would you rather be first to default on three AAA names or just take default risk straight on a single A name? I don't know exactly where the crossover is, but there is a fair tradeoff there where first to default on a higher quality basket is not necessarily a bad trade.

I have another example. It's kind of like avoiding the deemed sale. There are names out there that might be denominated in foreign currencies, or they might have durations that you don't like. If you don't want to mess with buying some issuer that is denominated in Canadian dollars, or some other currency like that, and you don't want to mess with buying the bond and doing a currency swap back, you might be able to take credit exposure to that same issuer and just get paid in U.S. dollars in a certain amount of basis points as Kevin was illustrating just single name CDS.

The other thing, and this is just a little warning, although we don't know where this is going to come out, is other than temporary impairment (OTTI), which is EITF 03-1. This has not been finalized yet, but what it basically says is that if a bond goes underwater by a certain amount for a certain period, we think that it's temporarily

impaired and you're going to have to write it down. Years ago, I think, you could make these arguments that "we plan to buy and hold" and things like that, but the Securities and Exchange Commission (SEC) is strongly opinionated about this. And I think you're at risk of not wanting to attract the wrath of the SEC, so people are coming up with some firm rules that just say if a bond does go to 80 cents on the dollar, we're going to write it down.

Now I don't have a problem with that at all, from a credit perspective, if credit events are driving it. But if you're buying long-duration bonds and rates go up 2 percent, all of a sudden you have long-duration, high-quality bonds that are trading at 79 cents on the dollar. If you start having to mark that side of your balance sheet to market while you're not having a corresponding mark on your liabilities, I think it's a disaster. And people say, "Well, gee, why aren't people more up in arms in this?" I've gone out and talked to rating agencies and other institutions. Banks don't care. Banks don't buy 20-year corporate bonds. They're buying three- to four-year stuff that's not going to go to 80 cents on a dollar because rates rose. Pension funds don't care. Mutual funds don't care. It's the life insurance industry that should be more worried about this.

Now a lot of people are lobbying hard. It hasn't been finalized. Another thing I'd like to leave you with is to go back and ask your people whether you think OTTI is an issue for us and have we written a letter and where do we think we're going to come out on this? If that does continue to be an issue, CDSs are another example of maybe how you can manage that without taking both your duration and credit risk in the same stack and then potentially triggering OTTI and other things that it is not your intention to do.

Some companies are trying to think about whether or not it makes sense to utilize CDSs. Basically you're saying that the traditional life company, XYZ, can look at a billion dollar portfolio where they go out and issue roughly a billion dollars of SPDAs or GICs or what have you. I think I said that in this example, the liability cost is LIBOR plus 30, and they're going to turn around and buy assets with a kind of a yield of LIBOR plus 110 and the numbers worked out. How much capital do we have to have and how are we going to drive our ROE?

The alternative would be to say, "Let's not go through those steps of issuing cash instruments. We'll replicate that same portfolio of assets we would have bought in the CDS marketplace by selling protection on those names, and let's see how we come out as a comparison." There are big advantages of utilizing CDS for a kind of synthetic business, if you will. The first one is the funding level. CDSs can have a positive basis or negative basis, but on real rough terms, they kind of have an implied funding cost of LIBOR, and that tends to be a better funding cost than most life insurance companies can obtain. So the first advantage would be a better implied funding cost.

The second one would be better capital charges. And at first some people thought

that's not right. This is very similar business, why should this have lower capital charges? But if you talk to rating agencies and regulators, they realize that in synthetic space, again, as Kevin mentioned, it's really not possible to take interest rate risk. You're not buying these things with callable bonds or maybe going a little long or short on purpose or by accident, and you really can't have an interest rate risk come back and snap you on these things. So the rating agencies and the regulators that I talked to said, "No that's fine. It should be a lower capital charge business." So you have better implied funding costs, lower capital charges, but there has to be a negative, right? Life would be too easy and it's very easy in this case. It's the accounting volatility. CDSs tend to get mark to market from a FAS133 perspective, which I find interesting. I think FAS133 was really being written in an area where I don't think CDS is—where there wasn't a lot of CDS activity taking place. I don't think they wrote those rules understanding the CDSs were coming down the pike. It will be interesting how they would have treated them if they had known that. But the fact is that we live in a world where accounting volatility is very important, so you have to ask yourself, "How much accounting volatility can I take? Under what circumstances or what structured products or machinations am I willing to go through to try to mitigate the accounting volatility?" I think that's where the industry sits right now. And with that, I'm going to turn it over to Kevin and Mike.

MR. REIMER: As far as the advantages now, I think Greg touched on a lot of them, but there are different advantages obviously from the buy side versus the sell side. One of the main advantages is when you're buying protections, hedging, a particular risk exposure that you have. Again, we talked about it before. You can also look at capital management, whether you're creating an optimal credit risk on a portfolio basically on the profile. There is potential there to increase your ROEs, and it kind of depends on what capital base you're looking at and that type of thing, whether you're looking at more of an economic capital. Also your models might take that into account, like a KMV model or credit risk metrics or something like that.

But I think the rating agencies and the regulators are going to start looking at an individual company's portfolios and seeing if you're optimizing things from the portfolio basis within that company. And that probably won't be in the too distant future. They'll be getting toward that type of thing.

Greg did touch on the negative and positive basis aspects of things. There is a potential still, even though there is a large convergence between the cash and synthetic markets, to have a negative basis in that sense. If you want to sell a bond, you might be trading at LIBOR plus 70 right now in the cash market, but if you can go out and do a CDS and pay 60 basis points; you're netting 10 basis points of basically free premium there, if you can get it on a risk and capital adjusted basis. You can tailor them for specific needs, and you can also take an outright negative view on a credit this way, kind of a like a short sale.

On the sell side, you can, synthetically or unfunded, create or take on credit risk,

by bundling your asset and liability side to the transaction and the key there is that it's very similar to the buying of corporate bond and the issuing of an GIC or some sort of funded liability. You have that implied LIBOR flat funding, and even after adjusting for things like illiquidity and differences in the default definitions, the cheapest to deliver and counterparty risk, your sale net/net is going to be better off than potentially your five-year cost of funding for your company.

Liquidity. The advantage on the sell side depends on the name that you're looking at, so it means you're better than others. But in general, I think there are a couple of cases. The creditor's market was severely tested in a couple of cases over the last few years. Right after 9/11, the market responded the week following, when it was open, with just about triple the amount of average volume. So, there was actually liquidity that was pushed into the market after 9/11 through the credit derivative markets.

Also ENRON—that settled without any disputes, contract disputes or any mechanical problems at all with over 800 contracts outstanding and about 8 billion in no show. That kind of proves that liquidity is there in the market.

You also had a diversified exposure to names. It can allow for higher credit quality and, as Greg was alluding to, a little bit there on rates and that type of thing.

Depending on your view on credit, you can look at a CDO transaction and pick where you want your subordination to be. How much first loss do you want below you? You can take your view into account, look at a risk-return profile, and if you have a view in correlation, you can get into permissible default transactions this way as well.

There's a positive basis, obviously on the sell side, where if you go out and buy a bond, let's say LIBOR plus 70, there might be a CDS available in the same name. LIBOR at 85 is the premium, so you can pick up an extra 15 basis points and can do the tradeoff between risk and capital adjusted on that.

Here, too, it increases exposure to higher quality names if you were using CDS. If you have an overall limited lower limit on your average portfolio credit quality, it opens up names that are potentially a little bit lower rated as well for you to use.

There are a couple of issues to consider when using credit derivatives. For example, documentation risk—restructuring doesn't exist in a cash market bond, so you have to get comfortable with that. The definitions for what a credit event is, you're looking at a reference entity here. It's on all borrowed money that a credit event can occur. It's not just a bond. It could be a loan. It could be a deposit, for which somebody hasn't made good on their obligations.

Reference entity is important to keep in mind as well. We're not talking about a particular bond in the market. Ford, for example, in CDSs, looks at Ford Motor

Credit as a reference entity, not Ford Motor Company. So you have to keep that in mind. There are obviously allowable deliverable issues as well. There are always pari passu issues dealing with senior unsecured debt, but there's the cheapest deliver option. You could actually get delivered an unconverted convertible bond, so you have to be comfortable taking that on. And depending on restructuring definitions, there are differences there.

Counterparty risk. This one isn't always thought about, but when you have a derivative and you want to unwind it, unless you unwind it with the same counterparty, you're going to double your counterparty exposure. So you have to keep that one in mind.

Regulatory issues, replications. The regulators for insurance companies require you to tag an existing or a new asset that's funded to a derivative in order to qualify it as replication. From a regulatory point of view, the question is whether you want to use treasuries or AAAs for a funded business or spread business that can get portfolio. That's not going to cut it from the hurdle rates that you're looking for. So you're comfortable going out and tagging this to say a BBB or A corporate. You have to talk to people about that, obviously, internally. There could be capital and tax issues with using derivatives if you're not that familiar with it. Remember these are unfunded transactions, so if you're a seller of protection and a credit event occurs, you're going to need cash to satisfy that obligation on the credit derivative. You can mitigate some of those risks by limiting your overall exposure to program or limiting your size to each individual name and having a quality, diversified portfolio.

As far as system constraints, you're going to make sure that your derivative system is somehow tied to your corporate bond system, because if you have (very similar to the receivables example that Greg was giving) all these different exposures, some in derivatives to a particular name on CDSs and some underlying, you need to make sure that they tie in with your investment guidelines for your single issuer limits.

In headline risks, these are still derivatives, so there are companies that do not like derivatives at time. You have to get your senior management comfortable with that, obviously.

MR. MICHAEL J. HAMBRO: I'm going to cover two topics. The first is regulatory overview and challenges for credit derivatives, and then I'm going to move to pricing CDSs.

The credit derivative market is truly global, and the major participants are banks and financial guarantors, some of which are owned by banks and insurance companies. During this topic, we're going to cover four major items. First we're going to identify who the global regulatory players are. We're going to describe the U.S. regulatory environment for credit derivatives, discuss some recent important

developments in this area, and, also, describe the environment in which U.S. life insurance companies operate.

First I'll talk about global regulation. The central banks of each country control the activity of the market participants in several ways. Then there is the Bank for International Settlements (BIS). This particular bank is majority-owned by the central banks around the world and provides a whole host of financial services. Very importantly, with respect to credit derivatives, it helps in the implementation of international financial agreements, and credit derivatives would fall into that category.

Under the BIS, there's the Basel Committee on Banking Supervision, and one of their most important contributions to date is the development of the Basel Capital Accord I in 1988. They're currently working on the Basel Capital Accord II, which is expected to be ready by the end of this year, and ready for implementation by the end of 2006.

Next is the International Swaps and Derivatives Association (ISDA), which is a global trade organization for derivative activities, in particular for privately negotiated derivatives, and credit derivatives would definitely fall into that category. They have developed a master agreement for derivatives, and they're constantly working towards standardizing the terms of credit derivatives. What is a credit event? What documentation should be in place? It's been a bit of a challenge for them.

As far as accounting, each market participant operates under the auspices of the accounting regulator of its country. Each country has some form of what would be called local GAAP.

The International Accounting Standards Board (IASB) is attempting and striving very hard to achieve uniform international accounting standards (IAS) globally. It already has in place a set of international accounting standards that is currently revising and the revision seems to be taking the form of an asset and liability approach, getting away from historical accounting or what's also called amortized cost accounting. The standard that governs derivatives is IAS 39. The European Union has committed to adopt IAS by the beginning of 2005.

As far as U.S. regulation, there are four groups that regulate banks and their activities and credit derivatives. Those are the Board of Governors of Federal Reserve System (the Fed), the FDIC, the Office of the Controller of Currency (OCC), and the Office of Thrift Supervision. These four groups have worked together in developing interagency capital requirements.

As far as accounting, of course, in the United States, there is FASB. For derivatives and credit derivatives, FAS 133, *Accounting for Derivative Instruments and Hedging Activities* is the relevant standard. There's a credit derivative area. First there's

been dispute over contracts and terms, and the ISDA is always working toward prospectively refining documentation in terms of agreements. But the basic problem is that the buyer of credit protection, of course, wants the most liberal definition of a credit event, and he also wants the most flexibility in terms of what he can deliver, what security he can deliver to the counterparty in consideration for receiving the face amount on the default.

The seller of credit protection wants exactly the opposite, so you have this inherent conflict. I have a recent example. This was settled, I believe, some time earlier this year—Railtrack, which was an English railroad service provider. Well, Nomura Securities had purchased protection from Credit Suisse First Boston in 2000 on Railtrack, and Railtrack defaulted in late 2001. So Nomura, in terms of getting consideration, was getting the face amount of the default of the securities or face amount on the defaulted bonds and wanted to deliver convertible bonds to Credit Suisse First Boston, who refused to take these bonds. It forced Nomura to purchase and deliver plain debt. And as a result, Nomura sued and has recently prevailed in court. The good thing about this is that it was a rather orderly settlement, and in the long term, it's probably going to be good for the credit derivatives market to have these disputes settled in an orderly way. Of course, the ISDA prospectively cleared up the issue of credit derivatives of convertible debt when convertible debt can be used to satisfy a contract.

Capital requirements are extremely critical in both the pricing and the availability of credit derivatives. We talked about the Basel Group, the Basel Committee on Banking Supervision. They developed Basel I back in 1988. Of course, back then it wasn't called Basel I. It has served its purpose very well, but there are several problems with it. All corporate debt has 100 percent weighting and there's not enough differentiation among different qualities of securities that a bank would own or loans that it has made. Sometimes a bank can actually get balance sheet arbitrage by buying protection or selling protection and keeping the risk on other assets that it has on its books.

Basel II will make several improvements, in particular, much more granular risk differentiation. Whereas now everyone has an 8 percent risk-based capital (RBC) ratio, prospectively, under Basel II, some banks may have as low as 1.6 percent and some might have as much as 12 percent. A bank's internal risk classification and quality of risk management and risk measurement will be used to determine what the capital requirements are for that bank. As far as the United States, it intends to adopt Basel II for very large banks and for banks that are active internationally.

As far as accounting developments, of course, in the United States, we have FAS 133. One thing I want to point out about FAS 133 is that a company may own a bond, let's say a credit-linked note, which would be considered a regular bond, but in FAS 133, that particular type of asset is considered to have an embedded derivative. That derivative needs to be split out from the host debt instrument and

accounted for separately.

Another recent U.S. GAAP development is that the derivative implementation group has issued B36, which addresses Mod-co contracts. It says that certain Mod-co contracts contain an embedded credit derivative, and that credit derivative must be split out from the host contract, and changes in the fair value of that derivative should go through earnings.

International accounting developments. Currently most banks in Europe would consider account derivatives off balance sheet. The IAS 39 is looking to put those assets on balance sheets as assets and liabilities and their change would go through earnings and fair value change.

The banks are not happy about this, feeling it's going to create a lot of earnings volatility, and they're resisting, despite the fact the EU has committed to adopt international accounting standards by 2005.

Moving to U.S. life insurers, they are subject to the investment laws of its particular state of domicile and. As many of us are aware, the state investment laws are not uniform. They're getting better, but there are still significant differences.

State derivative investment laws differ from state to state, but generally, there are three types of activities that are permitted: hedging, income generation and asset replication. Each state would have specific limitations about how much activity a particular life insurer could engage in. I won't go through the specific limits. But in particular, for income generation, a key limitation is that the income generation is only permitted in the situation where there are covered calls. So you'd have to already own that particular asset that you're covering.

This income generation limitation would mean that a life insurance company, for example, could not write a naked CDS. Life insurers, if they're going to be in derivatives at all, must have a derivative-use plan. I won't go into the details of that. As far as statutory accounting, *Statement of Statutory Accounting Principles No. 86* (SSAP 86) is the governing authoritative guidance.

One of the key differences between SSAP 86 and FAS 133 is if you have an instrument like a credit-linked note, FAS 133 would require you to bifurcate or separate out the embedded derivative from the note and account for it separately. SSAP 86 prohibits this from happening. You just keep it as an entire bond.

As far as RBC, which is very important, unfortunately, the NAIC RBC formula does not explicitly address the growing use of credit derivatives. This is too bad because let's say you have a company that owns an asset, a bond, on company A and it buys protection from bank B. Then from an economic perspective, it's no longer subject to the risk from company A, it's subject to the counterparty risk from bank B. Unfortunately, the current RBC formula for life insurance companies does not

seem to afford this treatment. So there's a need for RBC and economic capital convergence.

In general, some of the improvements that regulation of life insurance companies should undergo include uniform investment laws to make sure permitted activities are uniform. If there are numerical limits, to the extent that those are required, make them uniform. Let's explicitly address the growing uses of credit derivatives and improve RBC so that it addresses credit derivatives and also provides the appropriate economic treatment for derivatives.

Now I'm going to move to a pricing overview of CDSs. CDSs generally are the foundations for most or all credit derivatives. First I want to start with a "no free lunch" example. Assume that we have a five-year corporate bond rated BBB2 and it trades at 200 basis points over the five-year Treasury. We look at Moody's annual corporate bond default study, which is generally a pretty good source of data, and see that for this type of bond, the annual default cost would be 25 basis points. So a company could go out and buy the bond, buy CDS, and if the CDS costs around 25 basis points, then the company would have a net spread of 175 basis points and now be subject to just the counterparty exposure from the investment from the bank. And if the bank is rated AA or A+, then that exposure is quite minimal. So it would seem that the company gets kind of a free lunch. But actually, pricing CDSs is much different than this assumption indicates.

Hull and White have developed models and have written papers that describe their models that discuss pricing of CDSs. There are other models out there. I kind of like this one but I'm not saying that this is the only way to go about it.

First, we're going to start out with one reference entity, so we have a single bond issuer and we're going to ignore counterparty risk for the time being. We're going to make the assumption that the value of a Treasury bond is greater than the value of the corresponding maturity corporate bond, solely due to the possibility of defaults. So, in other words, the value of the Treasury bond minus the value of the corresponding corporate is equal to the present value of expected defaults.

If the bond issuer has a sufficient, wide spectrum of maturities that are very actively traded, then, by looking at the prices in the marketplace, we can determine the default probabilities from these prices at any particular future time. If this is not the case—let's say that there are gaps in the bond maturities for this particular reference entity—then we can just fill in those gaps by substituting another bond issuer that has the exact same risk profile as this one.

We're not talking about historical default probabilities. We're talking about risk-neutral default probabilities, which are based on market prices. In order to get default probabilities, we also need to make an assumption about recovery rates—that is the amount that an investor would get back if the bond has defaulted. Usually, for recovery amounts there's not much difference between risk neutral and

historical, so it's safe to use historical recovery rates.

A relationship between default probabilities and recoveries is that given a particular difference in the value of a Treasury versus the corporate bond, the higher the recovery rate also will produce a higher default probability. Having this information, inductively we can calculate the default density at each time interval up to maturity. Then we're going to have two quantities. A is the present value of the expected payoff from the CDS, and B is the present value of \$1 CDS premium that the buyer of credit protection is going to pay to the seller each year. If we equate A and B, then we get the CDS premium, according to the model.

I want to give an example. This is from the Hull and White work. This data is about three years old. There is a 5 percent flat yield curve, and the recovery rate on default is 30 basis points. There is a very close relationship between the CDS premium and the actual bond yield in this example. This is not a coincidence. In fact, I'll give a simple arbitrage argument that would demonstrate why this is the case.

If the CDS premium was a lot higher than the bond yield spread, then a savvy investor would just simply go out and short the corporate bond. He would sell the CDS, get the premium for that, and then buy the Treasury bond.

On the other hand, if the CDS premium was a lot lower than the bond yield spread, the same investor would just go out and buy the corporate bond, buy the CDS for protection, and short the Treasury bond. In each case, if you work it out, there seems to be some risk-free profit that the investor would get.

There are some situations in which the CDS premium will differ even more than from the bond yield spread. And there are four good reasons what that would be: if the treasury curve is very steep; if the bond isn't really trading at par, but it has a big discounted premium in relation to the coupons; if recovery rates, which are generally in the 30 percent to 50 percent range, are way above 50 percent, that's also going to cause a distortion; in the Hull and White model, we didn't price in liquidity considerations, and that can also enter into CDSs.

We talked so far about one reference entity and no counterparty list. Let's relax those conditions and extend it to where there are multiple reference entities. In fact, in most CDSs and most applications, there will be more than one reference entity and the payoff from the swap will depend on the distribution of defaults among the reference entities.

So we're going to construct a basket of N reference entities. In order to extend the model, we need to establish what are called correlations of credit indices among each pair of reference entities. The credit indices are simply a numerical description of the creditworthiness of each bond issuer, reference entity, at any particular point in time.

Let's look at what that will show in this example. We have reference entities ranging from one to 10; credit index correlation 0.4 and .8; the 5-year swap recovered rate is 30 percent. The swap pays off when the first reference entity defaults. And for one reference entity, that's the same as we had before. As you go from one reference entity to 10 reference entities, the CDS premium and the value of the CDS markedly increases. Also, note that as the credit index correlation increases, the premium for the CDS decreases.

Now let's extend the model to where we have counterparty risk, which is very important because if you buy a CDS and the counterparty bank goes under before the reference entity goes under, you're not going to get paid. So counterparty risk is very important.

Here we have a counterparty that ranges in the AAA down to BBB with credit index correlation of 0.4 to 0.8. The reference entity is BBB, five-year swap; the recovery rate is 30 percent. When the credit index correlation is zero, there is minimal decrease in the value of the CDS premium, even though the counterparty goes from AAA to BBB.

When we did a higher credit index correlation, the value of the CDS decreases markedly with the counterparty rating decreases. Also, given any particular counterparty rating, the CDS premium decreases quite a bit as the credit index correlation increases.

MR. HENKE: I want to point out another interesting use of CDSs and what the growing liquidity of this market brings us. I'm fortunate. At Citigroup we're a very large underwriter of investment grade securities. So we're the largest underwriter. We're very big in secondary trading. When you hear all the conversations between the corporate salesman and the investment community, it's we know that if you swap out of Wal-Mart 7s and you move into IBM 10s, you'll pick up 30 basis points. The question is: Is that a good trade or not? I think that's very hard to figure out. When you're dealing the cash markets, you have some duration component. What's the Treasury curve? What's the swap curve? I should get paid something more or less to move different places on the curve. We also have this other very difficult game that's going on, which is that they'll quote it based on what security they want. They'll quote it to swaps when they want to, or they'll say this is only 70 basis points over the 10-year Treasury.

But a lot of times the 10-year Treasury is on special. This is a very uniform thing that we can figure out. Look at the Treasury curve, not a manufactured one, but the actual Treasuries. They're all over the place. I mean basis points matter and that 10-year, when it's on special, can be expensive or some other Treasury might be cheap because somebody wants to borrow it or somebody doesn't want it, and our salespeople are very good at looking at that and saying, you know, I'm in a position that's relative to the 10-year Treasury because it's on special or off special.

So on a simplistic basis, you say, I think 30 basis points pickup is worth it. It's a more complicated problem than that.

One of the things I think CDSs do, at least in the initial transaction period (the majority of transactions are five-year trades), is to give you a much more uniform view of the credit view of IBM versus Wal-Mart or Ford vs. Chrysler. Any credit? It really separates out the spread to Treasuries into a pure credit view and a pure credit play. Once you get more comfortable with that, you can do all kinds of wonderful things.

It's hard enough to compare relative value when you have the noise in the cash marketplace. But what's really interesting is once you totally isolate the credit component, we can start talking about whether this is a good relative value versus this other bond—purely on a credit perspective. Then you can also look at historical correlations. If you think the map is fuzzy on the cash instrument, try to do a historical correlation on it. You'll get a mess.

But now we've been doing this long enough where you can get very good views of relative value, by sector, by name, by correlation, and you can remove a lot of the noise. I think this helps me to get a better view of what's going on, and why things are changing. I think there's a fundamental shift going on, and I think it really adds to the quality of the analysis of what's going on in the marketplace.

The one thing I would like to add about restructuring that's interesting to me is the debate about restructuring in the case of Xerox (or we mentioned Consec), is protection sellers will say that's not fair. Xerox didn't really restructure and here you are, you banks, they didn't default and you banks kind of negotiated some new bank lines with them. You're calling that a restructuring, okay and the bonds are trading at 94 cents on the dollar and so if I sold protection on that, you're asking me to pay \$6. If you're a reinsurer, I think that's a very valid argument, because you didn't do anything, you don't have a cash market alternative, right? You sold protection, you think you got hit by an option that shouldn't have been exercised, and you have to pay out under.

But if you're cash buying, the alternative is to have bought Xerox bonds two years ago. They'd be trading at 93 cents on the dollar. Or now I'm getting settled under restructuring, and in a sense, I have to buy the bond at 93 cents on the dollar. It's not as big a difference; the restructuring component is, if you're talking about people who aren't dealing in the cash markets. That's a little difference that I don't see pointed out in some of the literature.

Liquidity has been hinted at before. There are over 500 investment-grade names in the market. In some sense the names are always available. That's what dealers make a name to do. If you want a specific bond, the conversation starts, but then the dealer calls four people who own the bond and if none of them wants to sell it, you may not be able to buy. There's a price for everything, but clearly in the credit-

default-swap market, there's not this component where we have to go out and find the bonds. So in some ways that also improves liquidity and ability to trade names. They're trading in five basis point bids as markets a lot of times with quality names, sometimes even tighter than that.

Another interesting development in the marketplace is the acceptance of various indices, and that helps a lot with the option-based trading and things like that. Some of the other speakers mentioned options on even credit default spreads, which facilitates that. Dealers get much more comfortable making those markets when they can lay off risk in mass, big indices. The biggest credit indices out there are trading in two basis point markets, and those are quoted markets. So most institutions are trading within two basis point markets. That's very good for the development of not only liquidity, but also options on the spreads and more tools and flexibility and things like that.

The better understanding of correlation and these other tools also allow the ability to do single tranche CDOs. And by that I mean, when we previously did either a cash CDO, or even a synthetic CDO, we'd be piling up this portfolio of credit risk and then we would tranche up the pieces. We'd have a super scene here, an AAA tranche and various degrees of risk, then down to kind of an equity piece. And you would find buyers for all those pieces. Transactions would get done whenever you could sell the pieces for more than you could assemble the raw materials. That's just where the market clears, and that's where deals get done.

People would complain that it's the equity investors who have backed out. Now it's the mezzanine investors who have backed out. You have to have all the players aligned to make it work. Now because people will trade correlated books and things like that, you can come in and say, for example, somebody talked about what if I wanted to take a leveraged exposure to higher quality names or maybe even a senior tranche on a bunch of high yield names because I don't play in the high yield market, but I'll take a senior tranche on names that I don't have in my portfolio, because they're high yield names. You don't have to wait for the markets to align and have all the participants and all the tranches be ready to go. They will pull the trigger on one tranche and they will delta hedge and move their book around. So you can literally come in and customize whatever risk tranche you want on whatever portfolio of risks you want.

The other interesting development there is, not only can you do long risk where you're selling protection inside a CDO, you can actually do a single tranche, where you can say, I want to be long these credits and short these credits. Because we're going to get into relative value trades like that correlation matrix or something like that, you don't even have to be all long anymore. The dealer can set it up so your exposure is some tranche, or some portfolio that includes both long- and short-credit risks. So the tools available are pretty incredible.

I also want to point out the speed with which this is happening. We really saw in

1990 to 1999 that were banks just doing regulatory deals. That really wasn't what I would call a liquid market. People weren't really putting together credit portfolios that way. All of a sudden it started taking off. In 2001, it was the first deal where you could do a managed synthetic CDO. In other words, it was one of these transactions where we piled up a bunch of CDSs and sold off the various tranches, and the manager could not only change the credits they were short, but could actually go long some credits. In other words, it was a two-way market inside of this thing. People wouldn't have even understood what that was in 1998 or 1999. Those transactions are almost commonplace now. We see people come in and put together a \$1 billion, \$2 billion and \$3 billion portfolio and execute within a couple of days. That's just unheard of in the cash markets. And that's almost commonplace now. The interesting thing about that too is when we talk about risk management and things like that, if you were to go and look at most insurance companies' Schedule Ds, you can see where they bought most of their bonds, and they bought most of their bonds when that new issue came to market. And I understand why that is. If you go to try to purchase \$100 million of IBM bonds, you're going to spook the market. So the only way people put together sizable investment portfolios in chunks is usually when IBM is doing a \$2 billion offering. Then you can get your \$100 or \$200 million chunk.

The flip side of that is, again, when we look at our portfolios, you'll find they're assembled largely based on the new issue calendar. I think it would be pretty coincidental if the optimal credit profile from a diversification standpoint happened to be 100 percent correlated when Wall Street tried to decide to roll out new offerings. You just know that's not the case. So CDSs give you the opportunity to tweak and really look at your portfolio from a diversification risk-management perspective, as opposed to just relying on the new issue calendar to get things done.

I think that there are credit default derivatives offers, and all the extensions and variations just give you new tools that were not at your disposal a couple of years ago that are now very liquid, transparent and executable. I think it's going to help change the way insurance companies manage their portfolios and credit risk.

MR. FOWLER: Thanks, Mike and Kevin and Greg for your presentations. Hopefully, people have a better understanding now about what credit derivatives are and how they're used.

MS. MICHELLE SMITH: Is this market concentrated? If you looked at the number of counterparties, is there a high level of concentration in this market? And if there is, is that a concern?

MR. HENKE: I think that's an excellent question because you don't want to replace one form of risk with another risk, and I will say that it depends on how you look. Compared to the corporate credit marketplace, there are not that many counterparties out there, although I do think there are a substantial number of

counterparties out there. They're very high quality institutions. I don't know if you guys have any industry data on that. The real reason I get comfortable from a counterparty perspective is the use of collateral. The dealer community has gotten very sophisticated in how they manage risk back and forth and how they post collateral. Insurance companies were loath to pose collateral as recently as probably two or three years ago. I think that's been a big change in accepting the fact that the best way to manage counterparty risk is to have people post collateral on a daily basis. So if there is an issue, if credit exposure starts to build up, that there is collateral that is dollar good and you can manage that because there is some systematic risk. I mean the portfolio or the scenario where you have massive defaults, and money is going to be moving one way. You do have to question how sound is that counterparty. But that's why they don't look at it with a buy-at-home mentality. We're talking about risk management and Basel and all these things. They have to have collateral there every day to back those claims and what's going to be there. So, I think it's clearly an issue. I think there is some concentration risk, but I think the advent of using collateral is one of the most powerful risk-mitigation techniques out there, and insurance companies didn't want to get in a position where there was mutual posting of collateral years ago, and now almost all our clients are asking us for it, and I think it's the right way to go. Did you want to add anything to that? I'm no expert on that.

MR. REIMER: No I think that's right. The other thing to keep in mind as far as concentration goes, as well, is: What is the concentration out there? Even though it's a very liquid market and it's growing more liquid in the actual names that are trading and are really tradable, that there is still heavy concentration. Seen some studies lately, as far as you know the top five names do have a fairly high concentration out there. But you are able to get these better quotes and that type of thing on the market as Greg was mentioning to you before. It's not like you need to go out and find the bonds in order to purchase. You can create it if there is a dealer out there that has a quote. It's pretty reasonable.

MR. FOWLER: I think one of the things that you said, Greg, was that the next wave of people using CDSs and credit derivatives you thought might be the insurance industry, building upon what the reinsurers did a few years ago. Can you give a rough feel for percentage of insurers that may be using this or starting to look at it more seriously?

MR. HENKE: It's anecdotal. But I would say 50 percent of the life insurance companies that we talk to, which tend to be weighted toward the larger insurance companies, have executed at least some CDSs. I think a lot of them at this point are still saying, "We think this is a market that has information capabilities, and something we should be more in tune with. Let's allocate X hundred million of exposure because you know we know there's some accounting volatility, but based on this being a five-year product and two standard deviation moves being X basis points, we can live with that kind of accounting volatility. It's important, as Kevin was talking about systems, to make sure that you have the systems in place from a

legal and execution standpoint, from a regulatory standpoint. We can execute these, so I would say that the majority of companies have done some things. I think it's still in the experimental stage.

MR. REIMER: One thing to add is that as we've been looking within ING and trying to get approval for doing CDSs within the company, and at how others are using them, it ends up starting to be more on the investment side, where they are using it to hedge their bond portfolio as opposed to the insurers, the insurance side of the portfolio, liability side looking to replicate. That's where it's been seen. If they are going toward the replication way of doing it and actually writing derivatives, a lot of times the initial reaction is to try to make it as close as possible to the cash market as you can, get rid of restructuring, get rid of any types of deliverables we're uncomfortable with, but it's a risk/return tradeoff, and you're going to get dinged so much in the basis points, that's just not standard that you have to look at that and start to get comfortable with those different pieces.

MR. HENKE: I have a couple of other things that I'd like to add about that. It is interesting, whether or not as people do make the decision to get more active in this market, should it be done in the regulated insurance entity or should a non-regulated entity be set up to do some of the trading? Sometimes that impacts how you look at collateral. Also, after thinking about my answer a little bit, if you would add the number of people who also participate in CDOs or synthetic CDOs, there are other variations. I was talking specifically about who said, "I'm going to become an active seller of protection in the CDS marketplace? I put a little 50 percent..." If you actually look at other applications, it would probably be higher than that.

FROM THE FLOOR: One of the things you mentioned, which would seem to inhibit further development of the credit derivatives market, is the mark-to-market issue under FAS 133. Have you heard anything about whether anyone is making noise about changing the treatment, especially if you are using it to hedge credit exposure? Let's say if the life insurance companies are hedging credit exposure that they have within their portfolio, would it be possible or is anyone talking about bringing in hedge accounting treatment for those types of transactions?

MR. HAMBRO: Do you mean hedging a particular asset? I would think that I have not seen anything in FAS 133 that would preclude that from happening. You know, in FAS 133, only you can isolate what risk you want hedged. So if you said you just want the credit risk hedged, you were just going to then take into account, it depends whether you're getting a fair value hedge or a cash flow hedge. But you could just take into account the degree to which the credit component changed.

MR. HENKE: I'm glad you pointed that out and I would agree with Mike, that if you were buying protection on a security that you have on your books, I think the bigger potential wave is in selling your credit protection which you can't make a similar argument to. I think you can buy protection, in fact, if you get any push back on that—I mentioned some examples where corporate bond traders and other

people were looking at hedging their portfolio where they would be looking to buy protection—clearly, if you write it as a financial guarantee, I don't think there is anybody who would argue that you shouldn't get hedge accounting treatment on that.

MR. HAMBRO: Where you would run into problems is if you constructed a portfolio of CDSs and you wanted to hedge a portfolio of bonds. Generally, in FAS 133, you really can't do a macro hedge. You have to go through all kinds of hoops to demonstrate that down to the most granular level, the core of the hedge effectiveness and correlations hold up at the very micro level. That would be very difficult to do, but for a single issuer, I think that would be fine.